



Optrex Selection Guide

DMC Character and DMF Graphic Liquid Crystal Displays



Apollo Display Technologies...
"The LCD Specialists"

We're easy to remember:

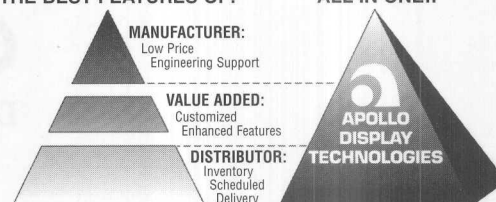
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OPTREX LCD...OPTREX LCD...OPTREX LCD...OPTREX LCD

Apollo Display Technologies is a unique manufacturer/distributor specializing in LCD technology. Since the beginning of the LCD module industry, Apollo has served the OEM market as a technical, stocking distributor and value added manufacturer of LCD products and services. Our standard product line of OPTREX LCD modules are sold at aggressive factory-direct prices. Our value added and semi-custom manufacturing services broaden the variety and performance characteristics to best suit customers' needs. It is our unique combination of low-cost standard products, large inventory, technical assistance and value added services that has made Apollo the first choice of so many display engineers.

THE BEST FEATURES OF:

ALL IN ONE!!



CHARACTER LCD: MOST POPULAR TYPES

High Contrast LC Fluid Accepts Fixed Voltage: Designers Save Cost of Contrast Controls

Apollo Display Technologies offers the Optrex "B" series of LCD modules featuring a high contrast supertwist LC fluid allowing a single fixed voltage for both contrast and logic. The LC fluid's stable voltage characteristics eliminate the need for contrast voltage adjustment in many applications (0-50°C). The benefits are high contrast, wide viewing angle, streamlined system design and reduced material and labor costs.

CHAR x ROW	CHAR HT	BACKLIGHT	PART #	CHAR x ROW	CHAR HT	BACKLIGHT	PART #
16x1	9.66	REFLECTIVE	DMC16129N-B	20x4	4.75	REFLECTIVE	DMC20434N-B
16x2	5.55	REFLECTIVE	DMC16207N-B	20x4	4.75	Y/G LED	DMC20481NY-LY-B
16x2	4.35	Y/G LED	DMC50292NY-LY-B	24x2	5.55	REFLECTIVE	DMC24227N-B
16x2	5.55	Y/G LED	DMC16202NY-LY-1(B)	24x2	5.55	WHITE EL	DMC24227N-SEW-B-11
16x2	5.55	WHITE EL	DMC16207N-SEW-B	24x2	5.55	Y/G LED	DMC2074NY-LY-B
16x2	9.66	Y/G LED	DMC16230NY-LY-B	40x2	5.55	REFLECTIVE	DMC40218N-B
16x4	4.75	REFLECTIVE	DMC16433N-B	40x2	5.55	WHITE EL	DMC40218N-SEW-B
16x4	4.75	WHITE EL	DMC16433N-SEW-B	40x2	5.55	Y/G LED	DMC40267NY-SLY-B
20x2	5.55	REFLECTIVE	DMC50218N-B	40x2	5.55	Y/G LED	DMC40205NY-LY-B
20x2	5.55	WHITE EL	DMC20261AN-SEW-B	40x4	4.89	REFLECTIVE	DMC40457N-B
20x2	5.55	Y/G LED	DMC20261ANY-LY-B	40x4	4.89	WHITE EL	DMC40457N-SEW-B
20x2	9.22	Y/G LED	DMC20203NY-LY-B	40x4	4.89	Y/G LED	DMC40457NY-LY-B

GRAPHIC LCD WITH CONTROLLER ON-BOARD

Most popular Optrex LCD's with controller IC and RAM on LCD's driver board:

Type #	Resolution	Dot Pitch	Controller IC	Popular Versions (Type # -)	Comments
DMF50427	128 x 64	0.43 x 0.43	HD61202	-NYJ-LY	LED
DMF5002	128 x 112	0.54 x 0.53	T6963C	-N	Reflective
DMF50549	128 x 128	0.43 x 0.43	T6963C	-NU	Reflective
DMF50172	128 x 160	0.60 x 0.60	T6963C	-NU-SEW	EL
DMF5001	160 x 128	0.58 x 0.58	T6963C	-NF, -NYL-EB, -NY-LY	Reflective, EL, LED
DMF5003	160 x 128	0.58 x 0.58	T6963C	-NB-FW, -NF-FW	CCT, CCT B&W
DMF5005	240 x 64	0.53 x 0.53	T6963C	-N, -NF, -NF-SEW, -NY-LY	Reflective, Reflective B&W, EL B&W, LED
DMF5010	240 x 64	0.53 x 0.53	T6963C	-NB-FW, -NF-FW (back-lit)	CCT, CCT B&W
DMF50316	240 x 64	0.53 x 0.53	T6963C	-NF-FW-1 (edge-lit)	CCT B&W
DMF50773	240 x 128	0.50 x 0.50	T6963C	-NF-SLY, -NF-FW	LED, B&W, CCT B&W

GRAPHIC LCD WITH EXTERNAL CONTROLLER

Most popular Optrex LCD's with external controller IC or controller board required:

Type #	Resolution	Dot Pitch	Controller Board	Popular Versions (Type # -)	Comments
DMF50202	128 x 64	0.44 x 0.60	PC55, CDS6255	-NY-LY	LED
DMF50051	128 x 64	0.44 x 0.60	PC55, CDS6255	-N-SEW	EL
DMF50374	160 x 64	0.60 x 0.60	CDS1330, PC\104-1330	-NYU-LY-1	LED
DMF660	240 x 128	0.45 x 0.45	CDS1330, PC\104-1330	-N, -N-SEW	Reflective, EL
DMF682A	256 x 128	0.47 x 0.47	CDS1330, PC\104-1330	-NF, -NF-EW	Reflective, B&W EL
DMF6104	256 x 128	0.47 x 0.47	CDS1330, PC\104-1330	-NB-FW, -NF-FW	CCT, CCT B&W
DMF50081	320 x 240	0.30 x 0.30	CDS1330, PC8106N, VGA-104N, PC\104-1330	-NB-FW, -NF-FW, NY-SEW	CCT, CCT B&W, EL
DMF50417	320 x 240	0.30 x 0.30	CDS1330, PC8106N, VGA-104N, PC\104-1330	-NY-LY	LED
DMF50174	320 x 240	0.36 x 0.30	CDS1330, PC8106N, VGA-104N, PC\104-1330	-NB-FW, -NF-FW	CCT, CCT B&W
DMF50268	320(x3) x 240	0.09(x3) x 0.33	PC8106N, VGA-104N	-NCU-FW-11	CCT 5.7" Color
DMF50036	640 x 200	0.35 x 0.49	CDS1330, PC8106N, VGA-104N, PC\104-1330	-NBU-FW, NFU-FW	CCT, CCT B&W
DMF50357	640 x 200	0.27 x 0.33	CDS1330, PC8106N, VGA-104N, PC\104-1330	-NF-SEW	EL B&W
DMF50766	640 x 480	0.079 x 0.237	PC8106N, VGA-104P	-NC-FW	CCT 7.5" Color
DMF50383	640 x 480	0.23 x 0.23	PC8106N, VGA-104N	-NF-FW	CCT 7.2" B&W
DMF50260	640 x 480	0.30 x 0.30	PC8106N, VGA-104N	-NF-FW-15	CCT 9.4" B&W
DMF50715	640 x 480	0.30 x 0.30	PC8106N, VGA-104N	-NFU-FW (-1)	CCT 9.4" B&W
DMF50414	640(x3) x 480	0.10(x3) x 0.30	PC8106P, VGA-104P	-NCU-FW-6	CCT (x2) 9.4" Color
DMF50753	640 x 480	0.33 x 0.30	PC8106N, VGA-104N	-NCU-FW	CCT 10.4" B&W
DMF50757	640(x3) x 480	0.11(x3) x 0.30	PC8106P, VGA-104P	-NCU-FW	CCT 10.4" Color

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Apollo LCD Controller Boards

PC\104 Bus

- **VGA-104P:** low cost, dedicated PC\104 bus controller for color passive LCDs requiring **positive** V_{hh} contrast voltages; supports screen resolutions from 320x200 to 640x480.
- **VGA-104N:** low cost, dedicated PC\104 bus controller for monochrome (and some color) passive LCDs requiring **negative** V_{ee}/V_{adj} contrast voltages; supports screen resolutions of 320x200, 320x240, 640x200 and 640x480.
- **PC\104-1330:** low cost, general purpose PC\104 bus controller for sub-VGA resolution monochrome LCDs; features on-board character generator with a full graphic overlay capability; based around SMOS SED1330(5) controller IC; supports single scan screen resolutions of 160x64, 240x128, 256x128, 320x240 and 640x200.
- **PC\104-5000:** low cost, general purpose PC\104 bus interface board for graphic LCDs ("5000-Series") which have a Toshiba T6963C controller IC on the LCD itself; interface is 8-bit parallel data; the T6963C includes character generator ROM and 8k screen RAM with graphics bit-mapped; supports screen resolutions of 128x112, 128x128, 128x160, 160x128, and 240x64.

PCI Bus

- **PCI-4800:** fast, 32-bit PCI Bus controller for color TFT VGA (640x480, 16M colors), SVGA (800x600, 64K colors), XGA (1024x768, 256 colors) and EWS (1280x1024, 16 colors) active matrix color LCD's; can support LCD and CRT simultaneously; optional VESA advanced Feature Connector.
- **ULTRA-1:** a significant upgrade to the PCI-4800, this controller will be introduced in the 4th Q'96, featuring state-of-the-art color performance on VGA, SVGA, SGA and EWS active matrix TFT displays; up to 16.7 million colors; optional LVDS interface. Call for more details and availability.

ISA Bus

- **PC8106P:** low cost, dedicated controller for color passive LCD's requiring **positive** V_{hh} contrast voltages; replaces the standard ISA VGA video card; supports screen resolutions from 320x200 up to 640x480.
- **PC8106N:** low cost, dedicated controller for monochrome (and some color) passive LCD's requiring **negative** V_{ee}/V_{adj} contrast voltages; replaces the standard ISA VGA video card; supports screen resolutions of 320x200, 320x240, 640x200 and 640x480.
- **S-545:** 16-bit ISA bus controller for passive color and active color TFT LCD displays of VGA (640x480), SVGA (800x600), XGA (1024x768) and EWS (1280x1024) resolutions.

General Purpose CPU/MPU

- **CDS1330/VEE/32K:** general purpose controller for CPU/MPU with 8-bit parallel data interface; supports Intel and Motorola formats; includes V_{ee} LCD contrast circuit and 32K screen RAM (optional 64K); features on-board character generator with a full graphic overlay capability; based around the SMOS SED1330(5) controller IC; supports single-scan screen resolutions of 160x64, 240x128, 256x128, 320x240 and 640x200. [Note: this controller is often more popular than the CDS6255 noted below due to the CDS1330's multiple character fonts and graphic capabilities; however, since it can only support single scan LCDs, the CDS6255 is offered as an alternative].
- **CDS6255/ROM:** general purpose controller for CPU/MPU with 13-15 bit address and 8-bit parallel data interface; includes 32K RAM and optional character generator ROM; graphics bit-mapped where one pixel is one bit in memory; supports a wide variety of LCDs using 1-bit serial or 2, 4 or 8-bit parallel LCD interfaces, in both single or dual scan modes. [See note above regarding the CDS1330; the benefits of the CDS6255 controller are that designers can use the PC55 ISA board and SDV-55 software for development purposes of many display types and that it will support 640x480 dual scan screens, whereas the CDS1330 can only support single scan screens, usually up to only 240 rows of pixels].

RS232 Serial

- **CDSxxxC:** general purpose serial to parallel converter for serial RS232 interface to character LCDs which have the HD44780 (or compatible) controller on the LCD itself. Direct LCD mounting is available for many modules.

MITSUBISHI ACTIVE MATRIX TFT DISPLAYS

Resolution	Technology	Active Area	Module Size	Backlighting	Part #	Controller Boards
1280 x 1024	13.0" Color TFT	257.3 x 205.8	305.8 x 250.0 x 17.5	CCT (x2)	AA13WA6D	PCI & ISA (please call)
1024 x 768	12.1" Color TFT	245.8 x 184.3	279.5 x 199.5 x 8.0	CCT (x1)	AA12XD6C	PCI & ISA (please call)
800 x 600	11.3" Color TFT	229.2 x 171.0	264.5 x 193.5 x 7.0	CCT (x1)	AA11SB6C	PCI & ISA (please call)
800 x 600	10.4" Color TFT	211.2 x 158.4	246.5 x 179.4 x 7.0	CCT (x1)	AA10SD6C	PCI & ISA (please call)

SPECIAL PRODUCTS & SERVICES

- Touchscreens • Value-Added • Connectors/Cables • Anti-Glare Films • Negative Image
- Re-Polarize LCD • Repair LCD • Fiber-Optic Backlight • Int'l Character Set



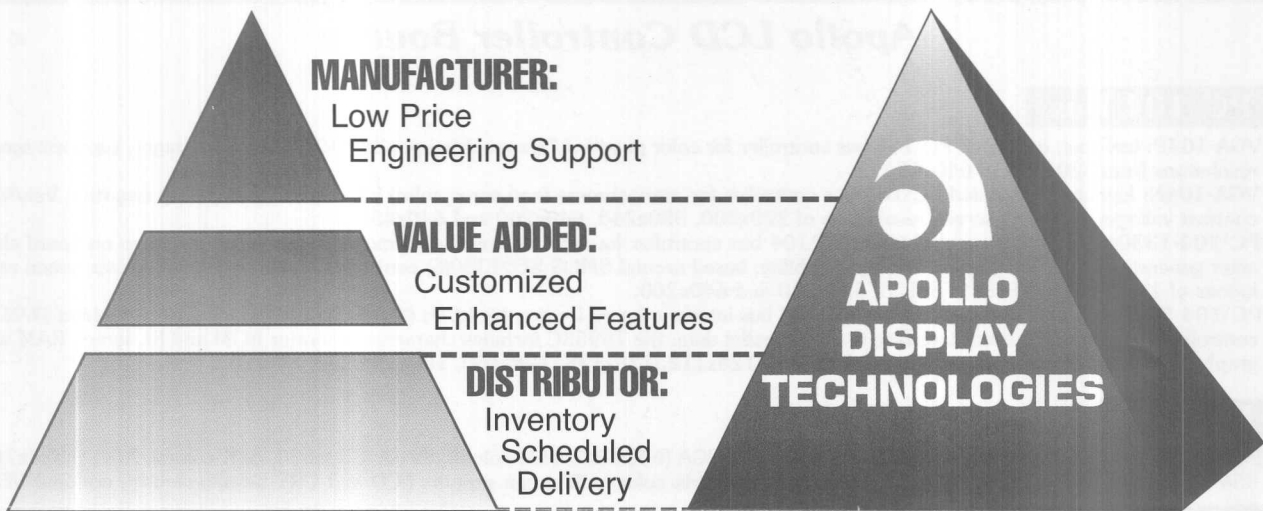
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- **DIRECT CROSS** to most manufacturer's LCD modules.
- **LOW PRICES...** Optrex is a world leader in LCD manufacturing and technology with Apollo as their largest U.S. distributor/value-added distributor.
- **JIT** delivery schedules... Apollo will stock & factory schedule to meet the demands of JIT and MRP systems, including "advanced planning" to help avoid shortages and overstocking.
- **VALUE-ADDED** services with factory **WARRANTY...** Apollo has a factory in New York with advanced LCD assembly and test capabilities.
- **TECHNICAL SUPPORT** from and **IN-HOUSE** staff of LCD engineers able to offer customers a diagnosis of engineering and production problems and offer the latest LCD technology as it evolves.
- **REPAIR** services... **SAVE** money, let us fix your displays.
- **INVENTORY...** Stock... Stock... Stock... as an LCD Specialist, Apollo offers the latest technology and most popular modules to develop many customers using the same or similar display types. This allows Apollo to have product faster than the standard factory lead-time of 12-14 weeks. Plus, Apollo can often make/modify parts to meet urgent delivery requirements.

Please call for a **FAST QUOTATION...** simply give us a part number, drawing, sketch or even just a general description of the part you are looking for and we'll give you a quote over the phone.

Apollo... The LCD Specialists



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